

REMARKS

Applicant thanks the Examiner for the thorough consideration given the present application. Claims 1-13 are pending in the present application. Claims 1, 2, 3, 8, and 9 are currently amended. Claims 10-13 are new. Claims 1 and 9 are the independent claims.

Regarding Claims 1-8:

The Office Action rejects claims 1-8 under 35 U.S.C. §103(a) as being obvious over Goto, et al. (U.S. Patent 5,828,014) [hereinafter "Goto"]. Applicant respectfully traverses these rejections and submits that Goto is fundamentally distinguishable from the present invention.

To place the teachings of Goto in perspective, imagine an elevator with, of course, a motor. Goto teaches that the speed of the motor may be conventionally obtained by a "pulse pickup." See, Goto, col. 1, line 17. Once the speed of the motor is read by the sensor, it is entered into certain calculations as the value of " ω_M ." See, Goto, col. 3, line 54. Goto discloses the value of " ω_M " as both the "actual motor speed value" (see, col. 4, lines 3 and 38; col. 5, lines 7, 18, 51; col. 8, lines 14, 23, 50, 52, and 57), and as the "motor speed detected value" (see, col. 8, line 18).

A fundamental distinction between Goto and the present case is that Goto accepts the motor speed value, " ω_M " as it is read by the sensors. There is no attempt to correct the sensor readings. There is no attempt to calculate a correction to the sensed speed. There is no attempt to account for any errors in the sensed speed in any of the later calculations. The sensed motor speed " ω_M " is whatever is detected by the sensor, and, whether accurate or not, is then fed into the rest of the calculations to control the motor. For all the calculations in Goto, the sensed motor speed is the raw speed read by the sensors, period. Goto gives passing acknowledgment that the accuracy of the sensor in detecting the motor speed will affect the calculations in the invention, but gives no guidance on how to correct the accuracy of the sensors. See, Goto, col. 6, lines 53-56. Applicant suggests that one of the reasons Goto does not consider drifting of the sensors in the Patent is that Goto suggests to use a "pulse pickup" sensor for obtaining the motor

speed. A “pulse pickup” type of sensor does not suffer from the drifting which is addressed in the present application.

In sharp contrast, the present invention provides a continuously corrected motor speed that is as accurate as possible to the actual speed. Goto merely senses the motor speed and, accurate or not, accepts it for all later calculations. The present invention senses the motor speed then corrects the sensed data so that it is as close as possible to the actual motor speed. The present invention seeks continuous accuracy of the motor speed data, while Goto merely detects a speed value and moves on.

Applicant respectfully submits that Goto neither teaches nor suggests at least the following elements of Independent claim 1, as currently amended:

Claim 1: A method for correcting speed feedback in a drive motor for imparting accurate upward and downward travel to a load, the steps comprising:
measuring a speed value of the drive motor by a feedback sensor;
provide speed references for upward and downward constant-speed travel;
detecting a plurality of speed measurements for upward constant-speed travel;
detecting a plurality of speed measurements for downward constant-speed travel;
averaging the plurality of speed references and measurements for upward and downward constant-speed travel;
identifying gain factors from said calculated averages of said speed references and speed measurements for downward and upward constant-speed travel;
identifying zero factors from said calculated averages of said speed references and speed measurements for downward and upward constant-speed travel; and
correcting the measured speed value utilizing said gain and zero factors to compensate for drift in the feedback sensor.

Applicant also respectfully submits that claims 2-8 are allowable at least based on the allowability of independent claim 1, from which claims 2-8 depend, based at least on that dependency. In addition, Applicants respectfully submit that Goto neither teaches nor suggests the following elements from dependent claims 2-8, as amended:

Claim 2: “The method according to claim 1, wherein the averages of the speed values of speed reference and speed measurement are calculated using a sum of the speed values and a total number of samples of the speed values.”

Claim 3: "The method according to claim 2, wherein the gain factor and zero factor are identified each time the averages of the speed values of speed reference and speed measurement are calculated."

Claim 4: "The method according to claim 3, wherein the gain factor and zero factor are updated by a forgetting factor."

Claim 5: "The method according to claim 3, wherein the gain factor and zero factor are updated by an exponential forgetting factor."

Claim 6: "The method according to claim 4, wherein, by applying the forgetting factor, measurement samples of recent history are weighted greater than earlier measurement samples."

Claim 7: "The method according to claim 1, wherein the method is adaptive to continuously update parameters for correcting said measured speed value."

Claim 8: "The method according to claim 1, wherein the drive motor is operatively incorporated as part of an elevator drive machine."

Rather than teaching or suggesting the present invention, Goto would be greatly improved by use of the present invention – a combination that would not have been obvious without the teachings in the present invention. In combination, the present invention would generate a more reliable and accurate motor speed value which, as acknowledged by Goto, is a factor in the accuracy of Goto's final calculations. See, Goto, col. 6, lines 53-56. Stated another way, the present invention ends with an accurate motor speed value, whereas Goto merely starts with some motor speed value, accepts it as accurate, and moves on to more calculations. The present invention may be combinable with the teachings of Goto, but Goto does not in any way teach or suggest the present invention.

Regarding Claim 9:

Claim 9 is rejected under 35 U.S.C. §103(a) as being obvious over Goto in view of Sawai, et al. (U.S. Patent 4,967,128) [hereinafter "Sawai"]. The Office Action notes that Goto does not disclose the use of a forgetting factor or similar for updating the gain factors. Sawai is cited as disclosing a servo motor control device which includes forgetting factors. See, Office Action, pages 3-4, citing "Sawai, Figure 7, items 1/Ki and K_{if} or similar (Figure 7, item A; col. 1, lines 57-68 and col. 2, lines 1-16)." Applicant respectfully traverses these grounds for rejection.

Applicant notes that Sawai teaches torque correction calculations wherein the value of the amount of current to the motor, designated "K_i," is sent to a current detector where it is converted into a voltage and then returned to the circuit designated as "K_{if}". The Office Action is read as interpreting the meaning of the small "f" in "K_{if}" as the "forgetting function." See, Office Action, page 4. Applicant respectfully disagrees with this interpretation of "K_{if}."

Initially, Applicant notes that a "forgetting function" is nowhere discussed in the patent, either expressly or inherently. Applicant respectfully submits that a more likely interpretation of the term "K_{if}" is as is reasoned as follows:

a) "K_i" is a place holder for a constant multiplier. See, Sawai, col. 2, line 1, stating: "K_i has no dimension." Additionally, the term "K" is used as a constant in other equations. See, Sawai, col. 2, line 17, defining: "torque constant K_T." See also, Sawai, col. 2, lines 36-37, disclosing: "counter electromotive force constant K_E[V/rad/rec]," and col. 4, line 51, disclosing: "correcting factor K_{IM}."

b) "K_{if}" is the voltage output of the current applied to current detector 5, and is measure in units of volt/amps. See, Sawai, col. 1, lines 61-65, stating: "The current I [A] flowing in the motor 1 is applied to a current detector 5, where it is converted into a voltage which is applied as a negative input I K_{if} to the point A. The input K_{if} is measured in [V/A], and the input I K_{if} is measure in [V]."

The Applicant reads Sawai as reasonably and implicitly defining the small "f" in " K_{If} " as the word "feedback," because the " K_{If} " is disclosed in Sawai as " K_I " after it is processed by a voltage detector and then it is sent back around the circuit as " K_{If} " -- therefore " K_I feedback," or " K_{If} ." See, Sawai, figures 1, 3, 7, and 8, element 5. Therefore, Sawai does not teach or suggest a "forgetting function," but rather teaches a current detection voltage feedback function.

Applicant also respectfully submits that neither Goto nor Sawai, alone or in combination, teaches or suggests the elements of independent claim 9, as amended:

Claim 9: An apparatus for correcting measured speed feedback, the apparatus comprising:
a measuring unit for measuring a speed value of a drive motor;
a calculating unit for calculating averages of a speed reference and a speed measurement from the measured speed value;
an identifying unit for identifying a gain factor and a zero factor; and
a correcting unit for compensating a drift in the measuring unit, the correcting unit compensating for the drift on the basis of the average of the speed reference, the average of the speed measurement, the identified gain factor, the identified zero factor, and on the basis of a forgetting factor.

Regarding Claims 1-13, "synchronous permanent magnet motor":

Applicant notes that the Office Action acknowledges that neither Goto nor Sawai teaches or suggests the use of a "synchronous permanent magnet motor." The Office Action cites *In re of Stevens*, 212 F.2d 197, 101 USPQ 284 (CCPA 1954) as authority supporting the rejection of the claimed feature of a "synchronous permanent magnet motor" as "as minor adjustment of the current invention." See Office Action, pages 3-4. Applicant reads the Office Action as rejecting the use of a "synchronous permanent magnet motor" as an obviousness rejection.

Applicant respectfully traverses the obviousness rejection of the feature "synchronous permanent magnet motor," however, in a good faith attempt to further prosecution of the application has amended the title, abstract, and claims to remove a "synchronous permanent magnet motor." Applicant believes that these amendments, alone will place the application into condition for allowance and respectfully requests that the application be allowed. Applicant

notes that the feature of the "synchronous permanent magnet motor" has been added to the claims as new dependent claims 10 and 12.

In further clarification of the invention as distinguished from the prior art, Applicant notes that the feature of the "speed reference" of the invention is the "true speed" of the motor, as opposed to a control command signal which is compared to a measured speed signal representing a typical closed loop servo control.

Conclusion

Since the remaining patents cited by the Examiner have not been utilized to reject the claims, but to merely show the state of the art, no comment need be made with respect thereto.

In view of the above amendment, Applicant believes the pending application is in condition for allowance. Thus, the Examiner is respectfully request to reconsider the outstanding rejections and issue a Notice of Allowance in the present application.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Michael K. Mutter Reg. No. 29,680 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

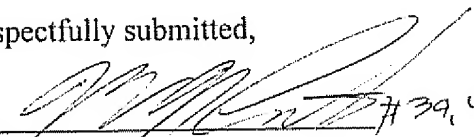
Application No. 10/756,380
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If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.14; particularly, extension of time fees.

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Respectfully submitted,

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